6.3.4 Soil Decontamination

Surface soils will be cleaned up in accordance with NRC license requirements and DENR permit requirements. The following section describes the methods for establishing site-specific cleanup criteria, monitoring during excavation of contaminated soil, and verification sampling following clean up.

6.3.4.1 Cleanup Criteria

Surface soils will be cleaned up in accordance with requirements contained in 10 CFR Part 40, Appendix A, including considerations of ALARA goals and the chemical toxicity of uranium. In accordance with NRC license conditions, Powertech (USA) will establish a radium benchmark dose, determine the natural uranium soil standard as a function of background concentrations and potential impacts, and perform a uranium chemical toxicity assessment. Cleaning up soils within the permit area to meet cleanup criteria approved by NRC will ensure that public exposure is within permissible limits and that radionuclide levels in soil are ALARA.

6.3.4.2 Excavation Control Monitoring

The purpose of excavation control monitoring will be to guide the removal of contaminated material to the point where it is highly probable that an area meets the cleanup criteria.

Gamma surveys will be relied on to guide soil remediation efforts. At least 12 months prior to commencing reclamation, Powertech (USA) will submit a decommissioning plan to NRC that will contain descriptions of methodology for both pre- and post-reclamation gamma-ray surveys This will include the use of a methodology for gamma-ray surveys for excavation control monitoring and final status surveys that will provide 95% confidence that the survey units will meet the cleanup guidelines.

The post-operation (pre-decommissioning) radiological survey will consist of an integrated area gamma survey and confirmation soil sampling and analysis to verify the areas requiring cleanup. The areas that will receive particular attention are those that are expected to have higher readings than surrounding areas and include diversion ditches, surface impoundment areas, well fields (particularly those areas where spills or leaks may have occurred), process structures, storage areas, and on-site transportation routes for contaminated material and equipment. Areas associated with wastewater disposal also will receive close attention. The surveys will identify soil contamination that exceeds the cleanup criteria and will be used to guide the cleanup efforts. After cleanup, the surveys will be used, in conjunction with surface soil sample analyses, to verify cleanup to the site cleanup criteria. Remediation will continue in areas not meeting action levels. This iterative procedure will be applied until all areas are determined to meet the action levels.

6.3.4.3 Surface Soil Cleanup Verification and Sampling Plans

Powertech (USA) will comply with the NRC license cleanup standards to ensure that public exposure is within permissible limits and that radionuclide levels in soil are ALARA. Compliance with cleanup criteria will be evaluated in terms of soil concentrations, which will be supplemented by field surveys employing gamma-ray measurements. A final gamma survey of the affected area and buffer zone will be performed using the GPS-based equipment or conventional equipment. Affected areas are those areas that have greater potential to be impacted by uranium solutions, dried uranium product (yellowcake) or liquid or solid waste streams that contain uranium or other radionuclides associated with uranium recovery operations. The areas that are most likely to be considered affected areas include diversion ditches, surface impoundment areas, well fields (particularly those areas where potential spills or leaks may have occurred), process structures, storage areas, on-site transportation routes for contaminated material and equipment, and areas associated with wastewater disposal.

A calculation of the potential peak annual total effective dose equivalent (TEDE) within 1,000 years to the average member of the critical group that would result from applying the radium standard (not including radon) on the site will be submitted to NRC for approval. Details will be provided in the decommissioning plan to be submitted for NRC review at least 12 months prior to decommissioning activities.

6.3.4.4 Quality Assurance